CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 97-109

ADOPTION OF SITE CLEANUP REQUIREMENTS AND RESCISSION OF ORDER NO. 85-41 FOR:

CASTROL NORTH AMERICA AUTOMOTIVE INC.
RICHMOND
CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

1. **Site Location**: Castrol North America Automotive Inc., formerly Burmah-Castrol Incorporated (BCI), owns and operates a petroleum bulk storage facility presently used to store petroleum lubricants which are blended, packaged, and transported off-site by barge, rail, or truck.

   The 4.9 acre facility is located at 801 Wharf Street in the City of Richmond's inner harbor. About half of the facility boundary on the north and east sides borders the Santa Fe Channel, a tributary to the Richmond Harbor Channel which flows into San Francisco Bay.

2. **Purpose**: This Order rescinds and replaces a twelve-year-old Waste Discharge Requirements Order to reflect the current status of groundwater contamination and advances in cleanup that have been made due to corrective action taken by Castrol both voluntarily, and as ordered by the Board.

3. **Site History**: During World War II, the site was part of the Kaiser shipyard, but only approximate locations of buried shipbuilding structures are known. The Bray Oil Company purchased the site in 1956. From approximately 1971 to 1981, Kodak rented portions of the facility for the storage and distribution of petrochemicals. BCI purchased the facility in 1981, and since then, has been operating a bulk oil storage, blending, and packaging facility. In 1986, BCI changed its name to Castrol Incorporated, and in 1994, the company acquired its present name, Castrol North America Automotive Inc.

   In 1977, the U.S. Coast Guard attributed oil sheens on the Santa Fe Channel to activities conducted at the facility. Bray Oil drilled 16 boreholes at the request of the Coast Guard and discovered petroleum hydrocarbons in eight of the borings. A concrete barrier wall, about six feet deep and 60 feet long, and two monitoring standpipes were installed along the shoreline between 1975 and 1978 to mitigate oil seepage into the Channel. In 1980 and 1982, shallow pits were excavated at the east and west ends of the wall to further intercept oil and prevent it from seeping into the Channel. Both pits were filled in 1988

with RWQCB staff approval because they had deteriorated and become safety hazards. Groundwater extraction from two monitoring wells was initiated in 1984 to reduce oil seepage into the Channel.

Volatile organic compounds (VOCs) which include both chlorinated solvents and aromatic hydrocarbons were first detected in groundwater when monitoring wells were installed and sampled in 1981. Groundwater has been sampled and analyzed at least semi-annually since 1982.

4. **Regulatory Status**: This site is subject to the following Board order:

   - Waste Discharge Requirements (Order No. 85-41) adopted April 30, 1985

5. **Site Hydrogeology**: The subsurface materials at the Castrol facility can generally be divided into three layers:

   - An upper layer of unconsolidated sandy gravel to gravelly sand fill with clay, 2 to 5 feet thick. This layer is usually unsaturated and generally contains no VOCs or petroleum hydrocarbons;

   - A 5 to 15 foot thick intermediate heterogeneous layer of low permeability silty and sandy clay fill and predominantly clayey alluvial sediments with some local lenses of higher permeability sediment. Groundwater is usually encountered in this interval at depths of approximately 5 to 9 feet below ground surface. The majority of VOCs and petroleum are detected in this layer. All but two of the active monitoring wells are screened in this interval;

   - A deeper very low permeability silty clay extending to at least 45 feet below ground surface.

Groundwater flow at the site is generally northeastward toward the Santa Fe Channel. Historic water level and tidal influence measurements indicate that the shallow wells, completed in the Bay Mud and fill, are hydraulically isolated from the Channel vertically by very low permeability clay located 3 to 7 feet beneath the site fill and laterally by a low permeability zone, or groundwater barrier, between the wells and the Channel.

Remnants of underground structures and piles remain from previous shipbuilding activities during World War II; however, the continuity and extent of remaining pilings and shipways is not well known.

6. **Summary of Groundwater Contamination**:

High concentrations of VOCs have remained confined to three small, isolated areas of the facility in the upper 20 feet of the subsurface near wells BC-1, BC-6, and BC-14 (Figure

2) since they were first discovered in 1981. None of the VOCs listed in the table below has been stored or used at the facility since Castrol acquired it in 1981.

In monitoring well BC-14 approximately 27 feet inland from the shoreline, benzene concentrations have decreased from the 1-2 mg/l range to a range of 100-200 µg/l since monitoring began in 1984. The downward trend in concentration levels appears to have reached a plateau as concentrations have remained in the 100-200 µg/l range for approximately the last five years.

Oil and grease was detected in 6 of the 15 monitoring wells sampled in 1996 and February 1997 at concentrations ranging from 1 to 43 parts per million (ppm). No measurable separate phase hydrocarbons have been reported in either the effluent from the two extraction wells (BC-3 and BC-8) or the shoreline seep sampling locations for the past 5 years. During this same time period, the highest concentration of oil and grease reported in a seep of measurable flow rate (1 L/min) was 5 ppm. Minor sheens up to a few inches in diameter were observed on the shoreline with the water seepage in 2 of 37 visits in 1996.

Constituents in Groundwater at the Castrol Facility

Contaminant	Historical Maximum Concentration (mg/l)	Maximum 1996-97 Concentration (mg/l)
1,2-DCA	820	230
Chloroform	330	9.2
Vinyl Chloride	2.2	0.32
Benzene	3.1	0.18
Oil & Grease	120,000	43

ND = Not Detected; NA = Not Analyzed

7. **Corrective Actions Performed**: In 1984, Castrol's consultant, in conjunction with the Department of Health Services (DHS) and the Board, prepared a Remedial Action Plan (RAP) to mitigate subsurface oil seeping from the facility into the Santa Fe Channel and to monitor the containment and concentration of volatile organic compounds (VOCs) in shallow groundwater beneath the facility.

In 1987, the DHS issued a Statement of Reasons (SOR) summarizing the bases for remedial action selection at the facility. The SOR concluded that contaminants at the facility resulted in virtually no risk of human exposure and that the VOCs were naturally contained. Subsequent implementation of the RAP consisted primarily of two elements: the cyclic pumping of groundwater from two wells to mitigate oil seepage into the Santa Fe Channel, and the regular monitoring and chemical analysis of facility groundwater monitoring wells for VOCs to ensure that VOCs remain contained.

Oil Seep Mitigation

The 1984 conversion of monitoring wells BC-3 and BC-8 to extraction wells as specified in the RAP helped reinforce the natural hydraulic barrier between these wells and the Santa Fe Channel shoreline. This was demonstrated by reduced seepage of oil along the shoreline. Out of 1,123 seep observations performed in the past five years, only a trace seepage consisting of a 2 inch diameter sheen in a puddle on the Channel bank has been recorded.

When pumping was initiated in 1984, it was difficult to accurately predict the length of time remedial pumping would be required because the quantity of oil in the soil and fill at the facility was unknown. At that time, it was estimated that pumping of wells BC-3 and BC-8 would be necessary for 1 to 2 years. Castrol has been pumping these wells for over 12 years. During this time period, no measurable separate phase product has been observed in the extraction well effluent and concentrations of total oil and grease in samples from these wells have decreased to typically less than 5 ppm. Castrol has therefore requested approval to discontinue extraction from wells BC-3 and BC-8 and to monitor the wells for product as specified in the RAP. The RAP contains a schedule for visual monitoring for oil in the wells and along the shoreline after pumping ceases. The DTSC has approved Castrol's request contingent upon RWQCB concurrence.

1,2-DCA Source Removal

Castrol conducted a voluntary soil removal action, which consisted of excavating soil containing 1,2-dichloroethane (1,2-DCA) in excess of 300 ppm, in conjunction with a rail car spill containment system upgrade in 1996. The voluntary soil removal action was conducted within a delineated area containing high concentrations of 1,2-DCA in soil, including free-phase 1,2-DCA beneath Castrol's primary rail spur, and in the immediate vicinity of wells BC-1 and BC-1D. An estimated 585 tons (390 cubic yards) of soil were treated on-site by thermal desorption to a less than 1 ppm total VOC limit. An estimated 2,278 tons (1,519 cubic yards) of non-hazardous, non-1,2-DCA-impacted soil were treated to levels below regulatory environmental concern off-site at the TPS Technology facility in Richmond, California. The excavation was backfilled with 390 cubic yards of treated, native soil, 231 cubic yards of clean, imported soil, and 38 cubic yards of bentonite slurry in such a way as to restore the low-permeability nature of the shallow sediments in the surrounding area. An estimated 39,000 gallons of groundwater were pumped from the excavation cells, treated with granular activated carbon, and discharged to the City of Richmond POTW.

Five-Year Review

In March 1997, Castrol submitted a report to DTSC in response to its request for specific information necessary for completion of a five-year RAP review. The report evaluated whether remedial actions implemented in accordance with the approved RAP had been successful in protecting public health and the environment. The report also recommended changes to the current remedial program based on that evaluation. The following proposed changes have been approved by both DTSC and Board staff and are incorporated into the Self-Monitoring Program accompanying this Order, as appropriate:

1) Discontinuation of biennial hydraulic tidal tests;
2) Discontinuation of groundwater extraction and treatment from monitoring wells BC-3 and BC-8;
3) Reduction in the frequency of Santa Fe Channel shoreline seep observations;
4) Reduction in the frequency of groundwater monitoring and reporting at the Castrol facility.

8. Basis for Cleanup Standards

a. **General**: State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in exceedance of applicable water quality objectives.

State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

b. **Beneficial Uses**: The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23 CCR 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels.

The existing and potential beneficial uses of shallow groundwater less than 100 feet below the ground surface underlying and adjacent to the site include:

- Industrial process water supply
- Industrial service water supply
- Freshwater replenishment to surface waters (San Francisco Bay)

At present, there is no reported or expected beneficial use of groundwater underlying the site other than freshwater replenishment to the adjacent Santa Fe Channel which is part of San Francisco Bay. The shallow groundwater at the site does not qualify for municipal or domestic use because TDS concentrations in most monitoring wells exceed the TDS limits for potential sources of drinking water established in Board Resolution No. 89-39.

The existing and potential beneficial uses of San Francisco Bay include:

- Industrial process supply or service supply
- Water contact and non-contact recreation
- Wildlife habitat
- Fish migration and spawning
- Navigation
- Estuarine habitat
- Shellfish harvesting
- Preservation of rare and endangered species

9. **Basis for 13304 Order**: There were several owners of this facility between the 1940s and 1981. During this time period, waste was discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance. The current owner, Castrol North America Automotive Inc., has assumed responsibility for environmental cleanup.

10. **Cost Recovery**: Pursuant to California Water Code Section 13304, Castrol is hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.

11. **CEQA**: This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.

12. **Notification**: The Board has notified Castrol and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.

13. **Public Hearing**: The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that Castrol North America Automotive Inc. (or its agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.

2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. GROUNDWATER COMPLIANCE CRITERIA

1. The following maximum allowable concentration levels (MACLs) shall be met in all point-of-compliance groundwater monitoring wells identified in the Self-Monitoring Program accompanying this Order, according to the tasks identified below.

Constituent	MACL (µg/l)	Basis
1,2-DCA	99	USEPA 10^{-6} cancer risk for consumption of aquatic organisms
Benzene	71	USEPA 10^{-6} cancer risk for consumption of aquatic organisms
Vinyl Chloride	525	USEPA 10^{-6} cancer risk for consumption of aquatic organisms

C. TASKS

1. REMEDIATION OF BENZENE IN WELL BC-14

Castrol shall submit a work plan and schedule, acceptable to the Executive Officer, for remediation of benzene in groundwater in the vicinity of point-of-compliance boundary well BC-14. Included shall be criteria for evaluating the effectiveness of the proposed corrective action measure.

COMPLIANCE DATE: October 31, 1997

2. THREE-YEAR STATUS REPORT

Castrol will submit a technical report, acceptable to the Executive Officer, evaluating the effectiveness of benzene remediation in well BC-14 based on the

criteria established in C.1. The report should propose additional remedial actions to meet the MACL if remediation efforts have not been effective in decreasing benzene concentrations.

COMPLIANCE DATE: November 30, 2000

3. **CONTINGENCY REMEDIATION PLAN**

Castrol shall submit a work plan and schedule, acceptable to the Executive Officer, for active remediation at or upgradient of the point-of-compliance boundary monitoring stations if groundwater monitoring analytical results exceed one or more MACLs, established in B.1 above for three consecutive monitoring events. This requirement does not apply to the remediation of benzene in well BC-14, which has already been addressed in Task C.1.

COMPLIANCE DATE: 90 days after Board receives groundwater monitoring report containing third MACL exceedance

4. **PETROLEUM OBSERVATION NOTIFICATION**

If any post-extraction visual inspection for the presence of separate-phase petroleum hydrocarbons in wells BC-3 and BC-8 or the shoreline seeps is positive, Castrol shall notify Board staff in writing. The written notification shall report the thickness of the hydrocarbon layer, if measurable, and any other relevant details. Staff may request that Castrol resume extraction pumping from BC-3 or BC-8 or some other form of remediation, depending on the amount and nature of petroleum present.

COMPLIANCE DATE: within 14 calendar days of discovery by Castrol

D. **PROVISIONS**

1. **No Nuisance**: The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).

2. **Good O&M**: Castrol shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.

3. **Cost Recovery**: Castrol shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such

waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by Castrol over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

4. **Access to Site and Records**: In accordance with California Water Code Section 13267(c), Castrol shall permit the Board or its authorized representative:

   a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

   b. Access to copy any records required to be kept under the requirements of this Order.

   c. Inspection of any monitoring or remediation facilities installed in response to this Order.

   d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by Castrol.

5. **Self-Monitoring Program**: Castrol shall comply with the Self-Monitoring Program as attached to this Order and as may be amended by the Executive Officer.

6. **Contractor / Consultant Qualifications**: All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.

7. **Lab Qualifications**: All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).

8. **Reporting of Changed Owner or Operator**: Castrol shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.

9. **Reporting of Hazardous Substance Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, Castrol shall

report such discharge to the Regional Board by calling (510) 286-1255 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services required pursuant to the Health and Safety Code.

10. **Rescission of Existing Order**: This Order supersedes and rescinds Order No. 85-41.

11. **Periodic SCR Review**: The Board will review this Order periodically and may revise it when necessary.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on September 17, 1997.

Loretta K. Barsamian
Executive Officer

Attachments: Figure 1 - Site Location Map
Figure 2 - Monitoring Well Location Map
Self-Monitoring Program

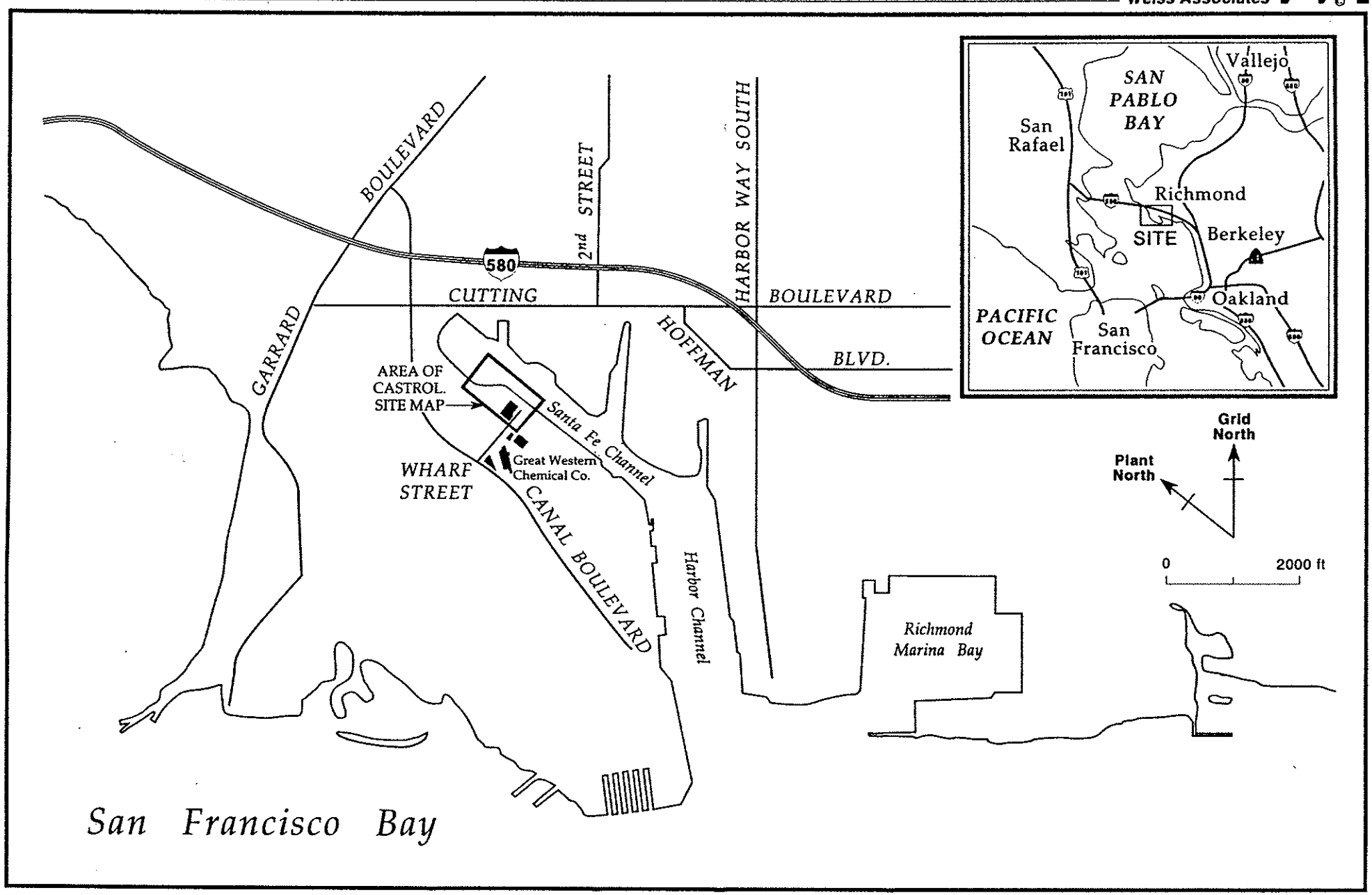

Figure 1. Site Location Map - Castrol North America Automotive, Richmond, California

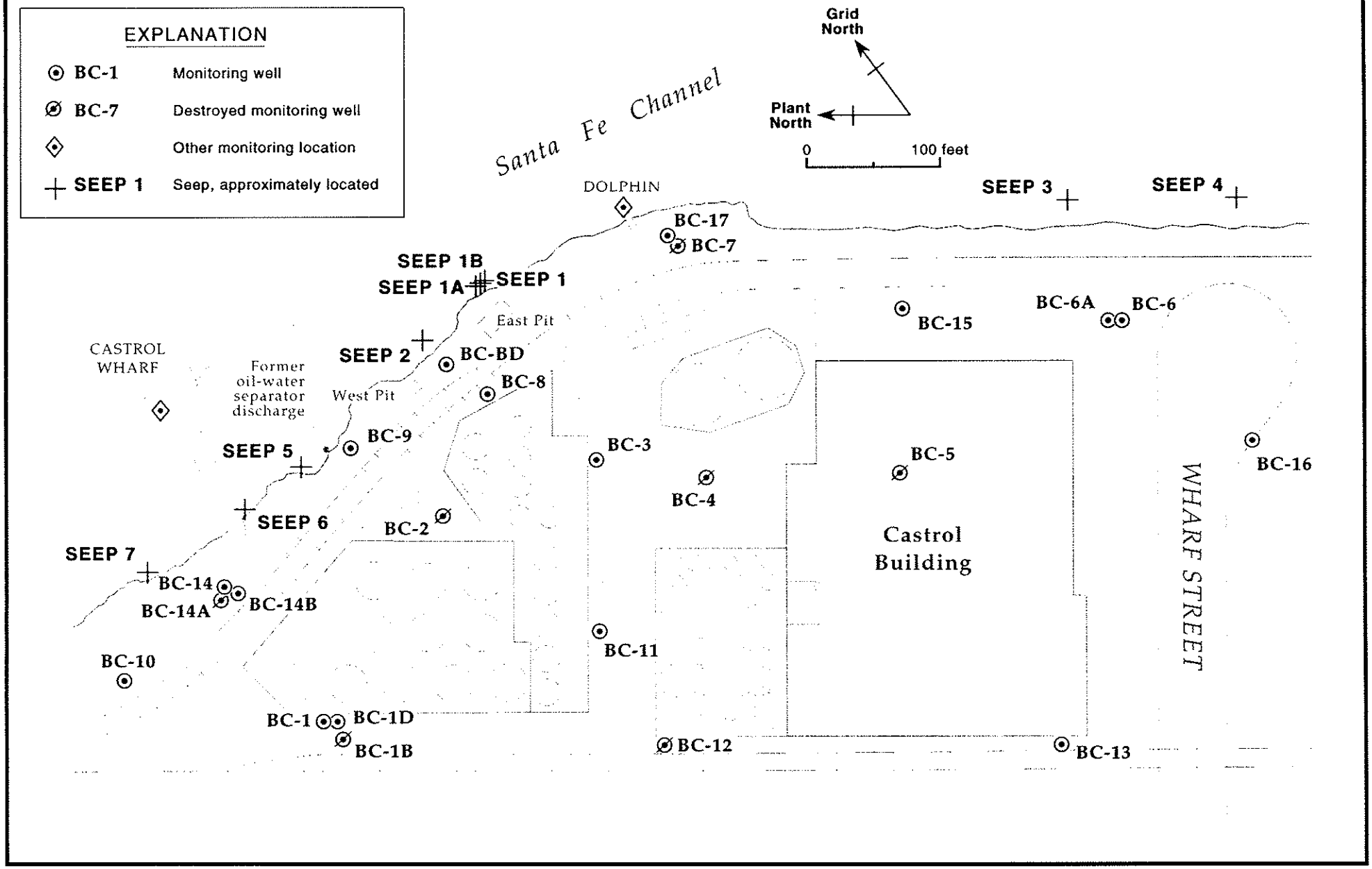

Figure 2. Monitoring Well and Shoreline Seep Locations - Castrol North America Automotive, Richmond, California

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

CASTROL NORTH AMERICA AUTOMOTIVE INC.
RICHMOND
CONTRA COSTA COUNTY

1. **Authority and Purpose**: The Board requests the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. 97-109 (Site Cleanup Requirements).

2. **Monitoring**: Castrol shall measure groundwater elevations semi-annually in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following schedule:

Well #	Sampling Frequency	Analyses	Well #	Sampling Frequency	Analyses
BC-1	A	8010; 8015	* **BC-10**	SA	8010/ 8020; 8015
BC-1D	A	8010	***BC-14**	SA	8010/ 8020; 8015
BC-3	A	8010/ 8020; 8015	BC-14B	A	8010/ 8020
BC-6	A	8010	BC-15	A	8010
BC-6A	A	8010	* **BC-17**	SA	8010/ 8020; 8015
* **BC-8**	SA	8010/ 8020; 8015	* **Seeps 1 through 7**	when flow rate > 1 L/min	8010/ 8020; 8015
* **BC-9**	SA	8010/ 8020; 8015			

* = Point-of-compliance monitoring station

Key: SA = Semi-Annually
A = Annually in dry season reporting period

8010 = EPA Method 8010 or equivalent
8020 = EPA Method 8020 or equivalent
8015 = Modified EPA Method 8015 or equivalent

Castrol shall sample any new monitoring or extraction wells quarterly and analyze groundwater samples for the same constituents as shown in the above table. Castrol may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

3. **Post-Extraction Observation Schedule for Wells BC-3 and BC-8**: Upon cessation of pumping, wells BC-3 and BC-8 will be allowed to fully recover and shall be visually inspected for signs of oil once a week for 1 month, and once a month through April 1998. Visual inspections shall be conducted semi-annually thereafter.

4. **Santa Fe Channel Shoreline Seep Observation Schedule**: Shoreline seep observation locations 1 and 1A through 7 shall be visually inspected for possible oil seepage at low tide on a monthly basis during the wet months of November through April. When observed flow from the seeps exceeds 1 liter/minute, the seeps shall be sampled and analyzed for VOCs (8010/8020) and petroleum hydrocarbons in the diesel to motor oil range (Modified 8015). Data shall be reported in the wet season semi-annual monitoring report.

5. **Semi-Annual Monitoring Reports**: Castrol shall submit semi-annual monitoring reports to the Board no later than 30 days following the end of the reporting period. The reporting periods will cover the winter/wet season (November through April - **report due May 30**) and the summer/dry season (May through October - **report due November 30**). The reports shall include:

   a. Transmittal Letter: The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the Castrol facility's principal executive officer or his/her duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.

   b. Groundwater Elevations: Groundwater elevation data shall be presented in tabular form, and a groundwater elevation map should be prepared for each monitored water-bearing zone.

   c. Groundwater and Seep Analyses: Groundwater and seep sampling data shall be presented in tabular form, and an isoconcentration map should be prepared for one or more key contaminants for each monitored water-bearing zone, as appropriate. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical groundwater sampling results shall be included. Each report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping - below).

d. Visual Observations: The report shall contain the findings of all post-extraction visual observations of wells BC-3 and BC-8 conducted in the interval since submittal of the previous report. The wet season semi-annual report shall also contain the results of visual shoreline seep observations.

5. **Violation Reports**: If Castrol violates requirements in the Site Cleanup Requirements, then the discharger shall notify the Board office by telephone as soon as practicable once the discharger has knowledge of the violation. Board staff may, depending on violation severity, require the discharger to submit a separate technical report on the violation within five working days of telephone notification.

6. **Other Reports**: Castrol shall notify the Board in writing prior to any site activities, such as construction or underground tank removal, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.

7. **Record Keeping**: Castrol or his/her agent shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Board upon request.

8. **SMP Revisions**: Revisions to the Self-Monitoring Program may be ordered by the Executive Officer, either on his/her own initiative or at the request of Castrol. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Loretta K. Barsamian, Executive Officer, hereby certify that this Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with site cleanup requirements established in this Board's Order No. 97-109.

2. Is effective on the date shown below.

Date Ordered: September 17, 1997

Loretta K. Barsamian
Executive Officer